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## PARAPHYSICAL MONISM.

*I. The Paraphysical Method.*—Metaphysics, as it represents the history of human thought concerning the nature of ultimate reality, has oscillated between two points of view, which may be described broadly as those of realism and idealism. The starting point of realistic argument is the universe at large, while that of idealism is individual human experience. Although the course of academic philosophy has led it farther and farther from the naïve realism of common sense in the direction of idealistic interpretations, the concomitant development of physical science has constantly encouraged reassertions and revisions of the realistic doctrine. At the present time it is being claimed, not without some justification, that the idealistic philosophy has lost contact with progressive science, and thus neglects the probable significance of scientific results for the study of the universe as a whole. This objection is especially forcible in a period, such as the present, in which science not only is taking tremendous strides, but is full of postulates or interpretations which tremble on the verge of being directly metaphysical.

It has for a long time seemed to the writer quite clear that a means of bringing idealistic doctrine into intimate contact with both modern physics and psychology is offered in the general theory outlined with remarkable distinctness by William Kingdon Clifford in his essay "On the Nature of Things-In-Themselves" (1878). It is the purpose of the present paper to restate Clifford's doctrine, and to demonstrate, if possible, some of its potentialities. The chief merit of the view, of course, is not that it may bring some new life to a dignified and traditional metaphysical theory, as such, but that, as a modification and development of this theory, it may preserve certain valuable properties of the latter—properties which realism even in its most modern form seems entirely to lack—while at the same time providing it with a basis for the same kind of progress which characterizes physical and psychological science, and realistic systems founded

upon a relatively uncritical acceptance of scientific results. At the same time, the theory is rendered liable to disproof by actual empirical findings, which from the standpoint of the search for truth can only be regarded as a desirable state of affairs.

Clifford recognized clearly three facts which are of fundamental importance. In the first place, he agreed with Descartes that thinking is always an affair of some individual human mind, and that consequently the point of view of any carefully wrought-out system of belief must be that of the consciousness of the individual believer. Secondly, although no individual can directly perceive the consciousness of any other individual, every individual believes implicitly in the existence of the consciousnesses of his fellow men. Thirdly, such a belief can furnish us with the foundation for a methodic study of an objective (or 'ejective') universe, of which other human consciousnesses form only a small part.

Suppose that we symbolize any concrete individual mind by the letter *S*. This individual, following the method of modern introspective, analytical psychology, finds himself, at any instant, to be a consciousness or a field of experience, consisting in connected complexes of numerous qualitatively different elements sometimes called sensations—when they are intense,—or images—when they are weak. The word 'sensation,' may be somewhat misleading, however, as it is often employed to designate a supposed relation existing between *S* and the contents of *S*, instead of standing for the contents—concrete colors, sounds, touches, etc.—themselves. These complexes of qualities tend to exhibit a general bipolar variation which gives them what is spoken of as their *affective tone*. They also vary in a dimension called *degree of clearness*. Apart from these complexes, introspection (of *S*) reveals no soul or ego. The personal pronoun always refers either to the whole psychical system or to some particular part of it.

*S* finds his consciousness to be divisible into two more or less contrasted moieties, one of which makes up what he denominates the 'external world,' and the other of which constitutes the inner world of his 'bodily feelings.' He discovers that 'thought,'

'the self,' the emotions, and other much obfuscated mental terms have their meaning as factors in this body complex. A careful study of the changes which occur in the 'external world,' leads him, after elaborate and hypothetical reasoning, to a system of conceptions which is designated as *physical science*. Upon the assumption of the 'uniformity of nature,' these conceptions—although highly abstract—apply more or less directly to actual happenings in *S*'s external world; but the important thing about the physical scientific system is that it helps him enormously in determining the relations of his inner body complex with this 'outer world,' so that the whole shall be as harmonious as possible.

However, *S* is not satisfied with the development of a psychology and a physics, since he is unable to believe that he, alone, is the universe. A critical comparison of the properties of the theoretical physical world with those of the external world of his sensory perception throws doubt, in *S*'s thought, upon the existence of either of these systems, independent of his consciousness. Nevertheless, he does find it possible to hold that at least certain parts of this external experience are *causally connected* with entities and changes which are really beyond his consciousness altogether. The most significant of these parts are his social human experiences. A simple inference has already led him to attribute these experiences to the existence of *other consciousnesses like himself*, and he adopts the outcome of this inference as the fundamental postulate of his metaphysics.

The further development of *S*'s metaphysical method depends upon the outcome of researches in psycho-physics, a branch of investigation which deals, in effect, with the exact nature of the relations existing between the elements of *S*'s physical world and special independent 'other-consciousnesses.' Extant data indicate that in general these relations consist in a point-to-point correspondence between the structure and processes of the consciousness and those of a *single stage* of the physical process of response, the *central* or adjustor stage. This *postulate of the monophasic cerebral determination of consciousness* underlies the remainder of the argument, and although traditional and plausible, it may conceivably be disproved by further empirical research.

Since in *S*'s system of physics, brain processes are not conceived to be fundamentally different from physical quantities in general, he finds himself forced to conclude that if other-consciousness exists for these physical quantities, it exists for each and all. Argument from the continuity of nature thus leads to belief in a complete universe of other-consciousness.

Let us speak of *any* individual consciousness, *S*, as *subjective*, using the word 'any' in the mathematical sense. We shall suppose, with *S*, that the universe is not solipsistic and that there exists somewhat besides the subjective. All of this somewhat we shall call the *objective*. This use of terms implies nothing whatsoever concerning the inherent nature of the subjective and objective. Stated in the symbolism of the Boolean algebra, if *U* is the universe and *S* any part of that universe, *S* is the subjective—from the point of view of *S*—and  $\bar{S}$  (not-*S*) is the objective. The relation  $S + \bar{S} = U$  is obviously true, and means that any subjective together with the corresponding objective, makes up the whole universe.

Let us employ the word *object* to mean some part of the objective and the term *idea* to indicate some part of the subjective. It is clear from what has just been said that ideas and objects may be made out of the same kind of 'stuff,' and indeed in certain cases might be absolutely similar.

The objective and the subjective, although mutually exclusive, *interact* with each other, and the effects which the former produces upon the latter are at least partially determined—if the fundamental suppositions of *S*'s metaphysical theory are true—by the nature of the former. Each component in the objective can produce a separate effect in the subjective, whether the component in question be an element or a relation between elements. Consequently, there may exist a point-to-point correspondence between the objective and certain parts of the subjective, in particular with that portion which we call the system of physical science.

Thus, if I select any particular component in the physical world, this will in general possess a determining cause in the objective. This cause is in no sense identical with the part of my

physical world which it determines, but since from an epistemological point of view it is indissolubly connected with the latter, it is highly desirable to designate it by a name which indicates both the distinctness and the interdependency of the two things. Let us, then, pardon a barbarism and attach the prefix *para-* to any physical term to signify the corresponding objective or para-physical term. Thus, a para-atom is the objective correspondent of a physical atom, para-space is the objective parallel of the space of geometry, etc.

Ideas and conceptions exist as parts of the subjective, and in metaphysics, or paraphysics, they refer to parts of the objective as meanings. However, in order that they should be intelligible, they must also have subjective meanings. Since an object is, by definition, inaccessible to the subjective, the definite reference of the conception to the object must be indirect in its mechanism. To refer to any particular object, we refer to some definite para-physical term, that is, we pick out some definite part, *P*, of the physical world, and state that we are prepared to make assertions about its objective cause, para-*P*. All metaphysical assertions have the general form para-*P* is *X*. In general, *P* and para-*P* are neither identical nor similar, so that the proposition para-*P* is *P* is not true. However, it is not improbable that an idea (some portion of the subjective) can be found which will fall in the same class with para-*P*. If *I* is the class containing such an idea, the proposition para-*P* is *I* will be said to be a metaphysical truth. According to our view, metaphysical truth is a matter of more and less, and is proportional in any case to the *similarity* which exists between an object and the idea which is employed in its description.

The problem of metaphysics, thus presented, is that of determining the nature of the complete paraphysical world, *i. e.*, that part of the total universe which influences the subjective—presumably the whole universe with the exception of the subjective. We may now consider in greater detail the means by which we may perhaps hope to accomplish this end. The theory which we shall ultimately develop may be denominated *paraphysical monism*; it is closely related with the doctrines of psychical

monism and panpsychism, advocated by Strong, Prince, Heymans, Fechner and others.

The supposed relation between the total objective universe and that part of the subjective which we call the physical world, or the system of physical knowledge, is one of *point-to-point causation* or determinism. Experiment shows that the most satisfactory method of expressing the relationship of causation is by means of the so-called 'mathematical function,' in which the state of one quantity (or quality), the dependent variable, is represented as determined at any time in some special way by the state of another quantity (or quality), the independent variable. Hence we can translate the statement that the subjective physical world is causally determined by the objective psychical world in general, into the proposition that the physical world is a function of the objective psychical world. We can write this symbolically as:  $P = f(\text{para-}P)$ .

The general statement that the physical world is a (mathematical) point function of the objective world—and *vice versa*—gives a comprehensive general account of the relationship which exists between these worlds, as well as of the method by which the latter may be deduced from the former. It is of course conceivable that the functional relation which connects each individual  $P$  with its  $\text{para-}P$  is unique, and if this is the case the project of deducing the nature of the complete parapsychical universe may well appear hopeless. However, it does not seem likely that such is the real state of affairs; our analysis of the physical universe has shown it to be made up of a fairly small number of closely similar elements, and has revealed its manifold processes as complex combinations of a few relatively simple laws; and it is plausible to suppose that the causal nexus between the total physical system and the objective system, of which it is a symbol, is also a mosaic depending upon a few elementary relations.

It is clear that if we can discover all of these component relations, we shall be able to determine the nature of any specific  $\text{para-}P$  from a knowledge of the corresponding  $P$ ; *i. e.*, by the help of the laws we can deduce the object corresponding to any physical conception. By 'deducing the object' we mean merely

that we can ascertain what among all of the contents of the subjective it most closely resembles, and *to what extent* it resembles this content.

But how, it may be asked, are we to obtain these elementary laws or functions? The answer is that this is and always has been the principal business of psycho-physics, or of physiological psychology. It is the purpose of this science, which is practically identical with the psychology of the laboratory, to discover how bodily conditions are related with those of the field of consciousness. A moment's thought will show that the expression  $P = f(\text{para-}P)$  has the general form of a psycho-physical law, where  $P$  is the physical variable, and  $\text{para-}P$  is the psychical one. The ordinary Fechner law,  $S = c \log R + k$ , would be an example of a relationship of this sort if—as Fechner himself supposed—the stimulus intensity  $R$  were the same as the intensity of the brain process immediately corresponding with the sensory intensity  $S$ . In this case,  $S$  would be  $\text{para-}R$ .

Thus far, psycho-physics has been obliged to concern itself largely with physical terms which are only indirectly related to the psychical terms which they influence. Such researches, even when their results are analytically formulated, of course do not furnish us with true psycho-physical laws, although they may provide part of the basis necessary for the deduction of such laws. Even to-day hypotheses regarding direct psycho-physical connections need not be purely matters of guesswork, and we may legitimately hope that as science advances we shall come closer and closer to an experimental measurement of these relations. On the probable assumption that all of the *fundamental* psycho-physical laws are concerned in the determination of human consciousness, such measurements will provide us with an empirical basis for metaphysical argument; although 'empirical' only in a sense which transcends the limitations of the so-called 'ego-centric predicament.'

*II. The Elements of a Definite Paraphysical Theory.*—A prerequisite of any attempt to outline a probable paraphysical system, on the basis of extant knowledge, must obviously be a review of the main results of modern physical and psychological analysis.

For the purposes which we have in mind, this need not be a lengthy task.

It is perhaps in part methodological necessity which has caused the physicist to reduce matter and the psychologist to reduce consciousness to certain elementary parts or *atoms*. Physical atomism has now reached what is probably its logical limit, while psychological atomism is making rapid advances. However, it is to be doubted whether this analytical tendency of thought could have gone so far if existence itself were not in some sense atomistic. The latest and most successful hypothesis in physics supposes all matter to be made up of complexes of positive electrical nuclei and electrons (negative units). The program of modern physics is to explain all of the properties of matter in terms of the dynamical interactions of these particles, and although it is an ambitious one it has thus far met with great success. At the present stage in the development of physical science it is practically inconceivable that the electro-molecular conception of the physical world is fundamentally wrong.

Modern introspective psychology has reduced consciousness to certain observable elements called sensations, or simple experiential qualities. It has been suggested by several writers that in all probability these sensations would be found to be further decomposable if our powers of subjective analysis were keener, so that the vast number of sensory qualities with which we are now familiar would be seen to result from diverse combinations of a distinctly limited number of psychical atoms. These atoms would all be absolutely different and the number and variety entering into any given compound, together with their exact form of combination, would determine the quality of that compound.

We are thus led to the theory of *Gestaltqualitäten*, or form qualities, which supposes that what we perceive as form in the coarser structures of consciousness appears as quality in the finer structures. Whether we call it form or quality depends upon its relation to what we may designate as our *threshold of analysis*. The objection to this theory, as ordinarily stated, is that it seems to imply the unreality of quality, by making it depend

upon the imperfection of an introspective perception: quality is the illusory representation of subliminal structure. The difficulty is removed if we say that structure exists in pure qualities only by virtue of their dependence upon coëxisting structure, or else because they can be *created* by the *fusion* of definite elements in a definite way, and later can be *decomposed* into these elements again. This fusion is less marked for the coarser than for the finer and more cohesive factors in consciousness. Quality and structure thus represent two ends of a single and continuous scale of variation. It is convenient to define the term *form* so that it can be used to designate the position of an entity in any part of this scale, with any desired ratio of structure to quality.

Every science has to deal with its subject-matter from two points of view, first, as statical or resting, and second, as kinetic or changing. Changes, as well as stable systems, possess characteristic structures, and analogy leads us to suppose that the same gradation between obvious structure and quality will be found here as in the case of statical form. Changes, the details of which fall below the threshold of the time sense, will tend to be perceived as wholly qualitative, and these qualities, as such, may be indistinguishable from statical *Gestaltqualitäten*.

We have noted that it is the present ambition of physical theory to reduce all physical phenomena to relations and changes in relation between electrical atoms, that is, to state them in terms of *constitution and its alterations*. The description of the physical world thus becomes a statement of the present configuration of its atoms, and the laws of that world tell how these atoms will *move* with respect to one another. It is clear that the point-to-point correspondence which the paraphysical monist believes to hold between the physical and the general psychical worlds must reduce in the last analysis to a correspondence between physical and psychical atoms, and their functions. Each essential elementary part of the physical world must be attributable to some definite elementary part of the paraphysical world. Hence it is evident that if the doctrines of psychological atomism and of form qualities are accepted, the task of parapsysics (and of metaphysics in our sense) must consist primarily in the trans-

lation of descriptions of physical structures into descriptions of psychical form and quality, or of physical change into psychical change and quality.

We can only do this by the application of a knowledge of the general functions which connect the psychical forms, changes and qualities with physical changes and structures. At present we are obliged to content ourselves with a largely speculative deduction of the nature of these functions from the very imperfect data which are at our disposal.

The fact that modern physics tends to postulate the existence of only two fundamental species of atomic particles, the electron and the positive nucleus, suggests that there are at most only two kinds of psychical atoms, and that all of the different qualities of consciousness are built up in various complex ways from these fundamental atoms. Accordingly, the ultimate elements of the real universe should be the para-electrons and the para-positive-nuclei. All electrons are alike, and it is probable also that all positive nuclei are alike—although they may possibly vary in magnitude. On the other hand, the difference between positive and negative electricity would seem to be the most fundamental difference in the physical world, and the suggestion is thus apparent that the para-electron and the para-positive-nucleus are also markedly different. In fact, it is interesting to suppose that they are ‘absolutely different,’ and that the relationship which exists between them constitutes the ultimate metaphysical meaning of difference in general.

Under the influence of their forces of attraction the positive and negative electrical particles combine with each other in the formation of complexes of greater or less intricacy, and hence we must infer that the parallel associative tendency among psychical atoms results in the production of similarly intricate psychical complexes. The conception of force is a very abstract one, but it is nevertheless advisable to define an equally abstract paraphysical conception, viz., *bond*, which is to be a synonym of para-force. Since both positive and negative forces—attraction and repulsion, respectively—exist among electrical particles, it is necessary to speak, also, of positive and negative bonds among psychical

atoms. A positive bond between two psychical atoms or other components is equivalent to their compatibility or associative linking together; a negative bond is equivalent to their incompatibility or power to inhibit each other. This general scheme is of course Herbartian, but at the same time, directly psychophysical.

If we study the complexes of electrical aggregates which constitute matter, we find that they differ from one another in at least three fundamental respects: (1) in order of *complexity*, (2) in *configuration*, and (3) in *stability* or *cohesiveness*. Our method of argument compels us to attribute three parallel dimensions to the corresponding objective psychical complexes, and it is natural to suppose that these dimensions are essentially the same in the psychical as in the physical. We shall speak, then, of the order, the form, and the cohesiveness of psychical complexes. The order depends upon the number of contained psychical atoms, the form upon the manner of attachment of their bonds, and the cohesiveness upon the average strength of the bonds. The three categories correspond, in a philosophical way, with the three fundamental physical dimensions: mass ( $M$ ), length ( $L$ ), and time ( $T$ ).

All physical structures and processes appear to consist in the arrangement and rearrangement of particles in three-dimensional *space*. The paraphysical position permits important contributions to the philosophy of space. It has already been hinted that our perceptions of the physical world—along with the system of physical science—are parts of our consciousness whose natural significance is wholly functional, and consists in their power to mediate favorable adjustments between ourselves,  $S$ , and our objective environment,  $\bar{S}$ . Represented in terms of the symbolism of the physical world itself, this environment is what lies outside of our bodies in the external universe, but the actual environment is the objective psychical one. The recent discussions of Bergson emphasize the fact that in spatial perception lies the essence of our capacity to adjust ourselves to our environment. Since Descartes, philosophers in general have exhibited a constant tendency to reduce the physical to purely geometrical

terms and to exclude these terms from the class of mental phenomena. The paraphysicist believes the last-mentioned tendency to be in error, but he does hold that the notion which it expresses has profound significance.

This significance is to be found in the fact that space is a special construct in our consciousness, so made as to form an appropriate arena for the simultaneous representation of many objective happenings. From the point of view of metaphysics, space is an artifact, or a metaphysical surd. The paraphysical doctrine of the nature of space departs from true Kantian theory only in so far as it does not imply the unknowability of the 'things in themselves' which get represented in the spatial manifold, and in the fact that it has a biological or a para-biological basis.

The paraphysical monist believes that space is only one of many possible forms of combination of psychical elements. He very strongly doubts its existence apart from animal consciousnesses, where it is necessary simultaneously to collect a large number of discriminable psychical factors in a single cohesive complex. It is clear from this interpretation that the arrangement of material things in space must have a very definite objective meaning, which is obviously to be found in the form of the objective psychical complexes, the manner of attachment of the psychical bonds. However, since space is one sort of arrangement of psychical units, other arrangements will possess certain fairly close similarities to it, especially as regards amenability to the fundamental conceptions and operations of the Boolean algebra.

The point of view of paraphysical monism permits us to dissipate at once the problem of the infinitude of empty space, which appears to be analogous to that of the expression of irrational numbers in mathematics. The world of material particles is finite and so, accordingly, is the objective world of psychical entities; both exist in a limited and definite number. Besides psychical atoms and their combinations, nothing exists objectively; if we abstract from the physical world all matter (or electricity), what remains—viz., empty space—must represent in the objective world: *nothing*. If para-space is identical with

nothing, then the infinitude of para-space means the infinitude of nothing, so that the problem of infinitude has vanished. It is important to bear in mind that the concrete space in human consciousness differs from the abstract, conceptual space of geometry and ordinary theoretical physics in at least three respects: (1) it is finite, (2) it has finite divisibility, and (3) it is anisotropic.

It may be claimed that there is a second problem in infinities which remains after that of space has been dissolved, namely that of the infinitude of *time*. The limits of the present paper will not permit a detailed discussion of abstract time. Abstract time is a highly symbolic means of representing diverse forms of *change*. Bergson's treatment of this subject will probably be found satisfactory. If the actual meaning of the concept of time is to be looked for in change, the abstraction of all concrete (psychical) existence from the universe would leave nothing in which change could occur, and hence, when such an abstraction has been made, the problem of the infinitude of time must disappear along with that of space.

However, it may be urged that we have still to consider the infinitude of change, but here again the problem arises from a misinterpretation. Time is often regarded as an existent manifold, but change certainly cannot be so regarded. Only one stage in any change *exists*, and that is the *present* stage. If the psychical universe is finite, there can be but a finite number of such stages in any present. If we attempt to conceive at once all stages, past, present, and future, we discover a problem of infinitude, but it is a specious one, because it does not apply to the existing world. Our persuasion that the problem is real is due to our inveterate tendency to conceive change in spatial terms.

We have by no means touched upon all of the points which are involved in the parapsychical conception of space and time. All of the spatial relationships which make up geometry and kinematics must be given a parapsychical meaning. Every definite spatial relationship determines certain unique conditions of dynamical or causal interaction between the related particles in a system, and when we translate spatial into non-spatial, or

hyper-spatial arrangement, we eliminate the space *quale*, while retaining the formal mathematical relationships which have been pictorially summarized by the permutations of elements of this *quale*. Para-distance, for example, must be strength, or rather weakness of elementary bonds, or else the time required for interaction to occur between two elements. Para-motion must be identical with change in the strength of bond. Para-direction will consist in relationships between the many elements to which some single element is bound, etc.

It is clear that the facts indicating the radical relativity of space and time which are now becoming of importance in physics, are in thorough harmony with the paraphysical interpretation of these conceptions. Indeed, the so-called *theory of relativity* may be regarded as giving us direct evidence upon the basis of physical observations, that space and time as we know them are in part subjective creations. It is characteristic of physical method to separate what is objectively determined from what is relatively subjectively determined; the application of the method long ago eliminated the 'secondary qualities' from physical consideration, and it is now disposing of certain supposedly essential properties of the 'primary qualities.' The relativity theory shows, in the first place, that space and time are logically interdependent conceptions, and secondly, that the concept of time is logically complex, in that it depends upon two prior concepts, those of change—or rearrangement—and of simultaneity. The concept of simultaneity, in turn, depends upon that of causation or interaction between separate particles or systems of particles. The tendency of paraphysical analysis, also, is to reduce the objective counterparts of both space and time to laws of change and interchange in a general atomistic system.

Let us now return to our discussion of the parapsysics of matter.

Matter is now regarded by most physicists as an aggregate of electrical particles held together by exclusively electrical forces. These forces originate between the electrons and positive nuclei and their first effect is the production of *atoms*. However, there is a certain residue of attraction remaining after the stability of the atom has been secured. This appears as chemical affinity,

and makes possible aggregates of higher order than the atoms, viz., *molecules*. Since the forces of chemistry are far smaller than those of the inner atom, the molecule is much less cohesive than the atom. There is still a residue of attraction left over from chemical affinity, and this is expended in combining the molecules together to form molar masses of matter, ranging in magnitude from the *colloidal* systems which characterize the substance of living organisms, to the larger aggregates of *crystalloid* material which compose the inorganic part of planets and of solar systems. It is probable that gravitation, which holds the universe as a whole together, represents a final residue of the primary electrical force, which is of an even higher degree of attenuation. The various stages of complexity of material organization are quantitatively continuous with one another, and probably represent levels of stability rather than a classification according to determining units of structure.

Arguing parapsychically from the above facts, we should expect the lowest-order combination of psychical atoms (para-electrons, etc.), to be the most cohesive, while the higher-order complexes should be less and less cohesive, in proportion to their intricacy. The multiplicity of sensory qualities which we know in our own consciousness probably exists on about the same level of complication as does the multiplicity of compound substances with which the chemist is familiar. The relations of similarity and difference between sensory qualities are closely analogous to those which obtain among chemical substances; they show gradations, related groupings, etc., and each possesses its own distinctive individuality. There are only about one hundred chemically different kinds of atoms, and thousands of different sensory qualities are known, so that if our parapsychical postulates are at all valid, these qualities cannot be identical with para-atoms, but must belong to a class of complexes more varied in constitution and hence of higher order. However, because of our inability introspectively to detect any structure in elementary sensations, they must correspond to relatively cohesive aggregates of physical particles, such as chemical molecules.

It must not be inferred from the above that we are to conceive

of such a sensory experience as a broad patch of blue color, for example, as the psychical parallel of a single molecule or small group of molecules. On the contrary, such an experience must probably be represented by a relatively large field of ionized substance containing billions of separate molecules. The intensity of this and other sensations would be proportional to the spatial concentration of the ions or molecules. As metaphysicians, we are concerned with human consciousness only in so far as it illustrates the nature of existence at large. If specific chemical substances in the human brain mean definite sensory qualities, they have the same meaning wherever they are found. Consequently we are led to regard the entire paraphysical and para-chemical universe as a vast and delicate pattern of marvelously varied and brilliant qualities, relatively only a very small number of which are known in our experience.

Every new combination of psychical elements, or radicles, must involve the creation of a new quality, since it means the appearance of a new psychical complex. We may suppose that in such combinations the qualities of the elements themselves form part of the new quality, although only a part. This principle of the fusion and mutual modification of qualities has often been discussed in psychology under the caption of 'mental chemistry.' It is a direct deduction from paraphysical presuppositions, and permits us to concur with Bergson in his contention that evolution can create real novelty.

Above the scale of molecular complexities we enter that of molar structure. The electrical forces existing between the constituents of crystalline solids are among the strongest and most unifying known for molar systems; indeed, it has recently been claimed that a crystal should be regarded as a very large molecule. Conversely, colloidal particles—which have long been looked upon as large molecules—may probably be considered as small crystals. In accordance with our general presuppositions, therefore, we should expect to find among the psychical systems corresponding with crystals and colloidal particles, especially cohesive forms of an order higher than that of para-molecules proper. Since 'cohesion' depends upon the presence of fields of

electrical or magnetic attraction between particles, cohesive higher-order systems should also exist in parallel with regions of matter where extensive states of electrification or *ionization* exist.

A special case of the last mentioned variety appears in living cells and *nervous activity*. The modern (Nernst-Lillie) theory of cell stimulation and the nerve impulse indicates that the enclosing membranes of living cells are the loci of electrical double layers, which undergo changes in intensity, or voltage, during stimulation. Such cell surfaces are therefore the seats of relatively open or extended fields of electrical and magnetic forces. It is to be supposed that the human consciousness, itself, finds representation in such a region of continuous electrification, somewhere in the cerebral cortex, probably in the frontal 'association areas.'

Thus far in our discussion we have offered no explanation for that peculiar dimension of the components of human consciousness which is known as degree of clearness. Variations of ideas in this dimension lie at the basis of the phenomena of attention, the maximally clear parts of consciousness constituting its 'focus,' and the unclear ones making up the 'fringe.' To explain these phenomena we may regard the so-called 'stream of thought,' or 'introspective commentary' as a parapsychical 'origin of coördinates' for the human consciousness, and then suppose that the clearness of any factor of consciousness represents the strength of its bond with elements of the thought stream. The meaning of the concept of 'bond' may thus be regarded as directly exemplified in phenomena of attention.

The ability of 'thought' to comment upon any psychical fact may be assumed to depend upon this same intensity of bond. If we designate the weakest bond which will permit of any such commentary as the 'introspective bond,' we may define the contents of the introspective consciousness as the sum of those parts of the psychical universe which have bonds with the passing thought as great as or greater than this introspective bond. All other psychical entities lie below the threshold of consciousness of this particular stream of thought. In general, thresholds would not be of significance where no commentary is possible,

but, theoretically, any psychical element might be taken as an origin of coördinates, with respect to which those other psychical elements with which it has the strongest bonds are maximally clear. Phenomena of threshold and attention depend upon the adoption of a point of view. In psychology and philosophy the point of view is naturally that of human thought, or of the process by which certain psychical facts obtain symbolic representation in *words*.

In this context it may be appropriate to say something concerning the possible pantheistic implications of parapsychical monism. The existence of the force of gravitation assures us on the basis of our fundamental presuppositions that all parts of the universe are bound together into a somewhat cohesive whole. It was Fechner's belief that this whole—as psychical—constituted a system which could appropriately be called 'the mind of God.' However, so far as we can see at present, this conception is poetical rather than philosophical, since the universal complex is very loosely integrated; and as the universe as a whole can have no environment, it is out of keeping with analogy to suppose that, in any ordinary sense, it is a thinking being.

Thus far we have concerned ourselves primarily with the *statics* of the parapsychical universe. Although it is a much more intricate subject, we must dispose of the dynamics, or paradynamics, quite briefly. There are two primary influences which cause change in the universe of psychical complexes, viz., positive and negative bonds, tendencies of association and of inhibition, respectively. The former encourage integrative, and the latter disintegrative changes. In the last analysis, these are the only two possible types of change in a universe made up of conserved atoms. Both positive and negative bonds operate by the generation of para-motion, which consists in change in bond intensity; from their nature, positive bonds thus tend always to become stronger, while negative bonds tend constantly to weaken. Para-motion is a conserved quantity which is potentially re-convertible into bond.

In our parapsychical account of the universe we have not yet considered the cosmical status of a very important psychological

variable, namely *affection*, or pleasantness and unpleasantness. The affective qualities do not belong in the category of sensations, and they appear primarily as special modifications of *complexes*, rather than of elements. We have already noted the possibility of *form qualities in the realm of change* as well as in that of statical structure, and analogy strongly suggests that pleasantness and unpleasantness are the form qualities of the two fundamental and opposed types of change which are possible in an atomistic universe, *integration* and *disintegration*. Synthetic, metathetic, and analytic physical reactions would thus correspond with pleasant, indifferent and unpleasant psychical processes, respectively. This general principle, which relates affection with types of psychical reactions—pleasantness with association, unpleasantness with inhibition—may be called *the affective law*.

The affective law is exceedingly rich in paraphysical implications. The simplest algebraic definition of 'integration' in terms of bond and rate of change of bond, makes the former concept include decrease of negative bond, as well as increase of positive bond, so that it does not refer exclusively to a spatial or para-spatial aggregation of elements. However, this usage is in harmony with ordinary ways of thinking, which would regard the elimination of inhibitory forces as an integrative effect. All disintegrative changes occurring in the physical world must probably be looked upon as corollaries of prior or simultaneous integrative changes. Two general causes of interaction between systems of elements appear to exist, *directed motion*, attributable to forces of mutual attraction (or repulsion), and *random motion*, due to general kinetic energy, or 'temperature.' Physical analysis indicates that, in the former case at least, disintegration occurs only in order that some new form of combination which is more cohesive than the one originally existing, shall be possible.

The necessity of this concomitant disintegration rests apparently upon the existence of both positive and negative forces between the particles of which the reacting aggregates are composed. The process of interference or conflict of these forces in the psychical or paraphysical universe may be called *colluctation*. Random motion may be regarded as an evolutionary product of

this conflict, which depends upon the individuality or discreteness of the elements of which the universe is made up; if there were no forces of repulsion, atoms could not continue to exist, and hence these forces and their consequences may be considered to represent a permanent chaotic and anti-synthetic factor in the general nature of things. Disintegrative changes attributable to random motion may be regarded as delayed results of collocation.

In the physical universe, therefore, the initial tendency of change seems to be in the direction of more and more stable or cohesive aggregates of material particles, a fact which is recorded in the second law of thermodynamics. Hence it would appear that if our affective law is true, the primary para-dynamical tendency in the objective psychical universe must be in the direction of the production of the greatest possible amount of pleasantness, the appearance of unpleasant affections being a secondary result of the tendency towards pleasure. The primary cause for the generation of any unpleasantness is to be looked for in the co-existence of negative and positive bonds between different parts of reacting psychical complexes. However, no matter what the change which takes place, the total pleasantness involved will always be in excess of the total unpleasantness, although in limited parts of the system there may be a surplus of negative affection. According to this theory, therefore, the entire universe is governed in its movement by a *psychical law of hedonic selection*, which falls short of perfect success only because of the inability of its individual components to coöperate completely.

All this is, of course, highly speculative, but not without some empirical foundation.

The concepts which are involved in the above discussion provide us with the basis for a theory of the *evolution of psychical forms*. The action of the integrative tendency in the universe is constantly directed towards the production of more and more complicated psychical structures, but the scope of this tendency is limited by the accidental conflicts which occur between the structures in question, these conflicts often resulting in their

partial destruction. It follows that the complexes which exist at any time represent a selection of the least conflicting types which have appeared up to that time. Structures which conflict and destroy each other, do so, and only those which do not conflict remain. These make up what in biological language must be called the 'fittest.' However, stability is a relative concept only, for the 'average life' of any structure is finite.

Among the most complicated of all of the psychical structures thus formed are to be found para-organisms and, in particular, para-human-organisms. These are vastly intricate and relatively unstable psychical complexes whose activities are intimately correlated with the nature of their psychical environments. Only a small portion of one of these para-organisms is constituted by its para-nervous system, and only another small part of this active system makes up the animal consciousness. However, it is the special function of this latter consciousness to serve as a clearing house for the efforts of the para-organism to coördinate its activities with the condition of its environment in such a way as to preserve the structure of the whole organic system. It is for this reason that the scheme of physical conceptions and perceptions which forms the most practical part of the consciousness in question, bears that special relation of symbolism to the objective psychical world which we have discussed in the very beginning of this paper. Paraphysical monism, then, is a self-explanatory system.

The affective law, especially in its connection with the theory of evolution, has an important bearing upon the perennial problem of purpose or teleology. Paraphysical monism, as developed in the present paper, although it emphasizes the psychical and even the appetitional side of existence, is not a teleological system of explanations. The existing forms in the universe are the products of the interaction of individual elements actuated by 'blind desire.' 'Purposes' are merely the special patterns assumed by these elements in their interaction, the nature of the patterns being determined largely by prior evolution, restricted by the principle of 'natural selection,' or stability. The imaginal or mosaic factor in purpose is as much a limitation of desire

as it is an expression, and the popular attempt to explain organic structure in terms of purpose completely reverses the actual problem, which is to explain purpose in terms of organic structure. In certain respects these views resemble those of Bergson.

It is obvious that the *system of psychology* which naturally follows from the speculative parapsychical theory which has been developed above, will correspond very closely with that of Freud. In the first place, it countenances the postulation of a truly psychic subconscious, although every element and process in this subconscious has a representation in the nervous system,—as have also the factors of the conscious. Secondly, the parapsychical psychology must employ a principle of inhibition, or 'repression,' as well as one of association. Thirdly, it would emphasize, with Freud, the biological origin of all organic springs of action (purposes), and the subconscious localization of their primary energies in the instinct complexes of self-maintenance (the ego complex) and sexual love.

The parapsychical scheme is also consistent with the modern program of *behaviorism* in psychology, so far as this is regarded as a methodological rather than a metaphysical doctrine. Human, as well as general animal behavior can be studied successfully by purely physical methods, and can be explained completely in terms of physical concepts. Moreover, the purely introspective study of consciousness can never lead to its explanation, or to the discovery of many of the laws which govern it, because consciousness is merely a 'cross-section' of a stream of causation, practically all of the determinants of which lie outside. Nevertheless, we must disagree with the assertions: (1) that there is no such thing as consciousness; (2) that consciousness cannot be studied by scientific methods; (3) that consciousness is not worth studying; and (4) that it can be explained in physical terms.

### III. CONCLUSION.

The above discussion presents in a qualitative and very schematic outline, the essentials of a metaphysical theory which, in unpublished form, the writer has already developed in far greater detail. Some of these details will perhaps be considered in future

articles. It will be clear to the critical reader that the system, as outlined, has close affinities with many historical schemes—besides that of W. K. Clifford—such as, for example, the Schopenhauerean theory of the will as *ding an sich*, the appetitional monadism of Leibniz, and even the psychic chemistry of Empedocles. Paraphysical monism may be regarded broadly as a purged and modernized edition of the general idealistic *Weltanschauung*. It is idealistic in the sense of considering the substance and structure of the universe to be similar to that of consciousness and of viewing the physical world as a special conscious construct, as well as in its acceptance of individual subjectivism. Its dependence upon the ‘point to point’ hypothesis of psycho-physical parallelism, with the accompanying implication of specific energies and ‘pontifical’ ganglia in the nervous system, also harmonizes with general idealistic preconceptions.

However, paraphysical monism rejects what the neo-realists regard as the fundamental assumption of idealism, the ‘constitutive theory of relations,’ and especially the application of this theory to the relation of cognition. It also refuses to keep up the pretense of adhering to the ‘ego-centric predicament’ as a logical basis for argument. While it denies that anything can be known *a priori*, and also that metaphysical truths can be known *a posteriori*, it at the same time offers a speculative postulate—which it is believed everyone must ultimately accept—as a foundation for the development of a methodic metaphysics in the light of empirical data.

On the basis of the method indicated by this postulate, the fundamental premises of our speculative theory can themselves ultimately be tested and found true or false. The manifold of elements and events which make up our conception of the physical universe is regarded as a symbolic representation in the individual human mind of a world of ‘other consciousness’ beyond this mind, so that all of the physical elements, structures and laws have a metaphysical meaning. The system of modern physical science thus appears as a great cryptogram, and if we can discover the cipher we shall be able to translate our physics

into metaphysics. An analysis of the situation shows that the key to the cipher is to be found—if at all—in the empirical study of the direct relations of determinism between consciousness and the physiological process of response.

The only merit which can ethically be claimed for a system of thought is that it is true. Unfortunately, in the case of metaphysical systems, this is the most difficult of all claims to substantiate. However, there are a number of points regarding the parapsychical scheme which prove it at least to be worthy of interest and attention on the part of philosophic thinkers. Its principal merit lies in its synthetic power. While in a sense pluralistic, it is the most monistic of all systems which attempt to give a unitary interpretation of the results of psychology and physics. It solves the riddle of psycho-physical parallelism and the problem of the evolution of consciousness. It provides metaphysics with clear conceptions and a definite method of investigation which brings philosophical thought into intimate contact with modern science, and makes scientific progress an asset to ontology as well as to technology. It is consistent with a clear-cut epistemological theory of empirical and of objective truth. It retains a large number of the results of historic philosophy, but unites them into a synthetic whole. It disposes of the antinomies of space and time; solves the mysteries of illusion and error, of the separation of the primary from the secondary qualities, and of the qualitative blankness of the fundamental entities of physical theory. Besides this, it provides us with what Fechner called a 'day view' of the universe, and offers a possible basis for an objective theory of value and of ethics.

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